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To:	Krista Zele	**From:**	Leigh Christian
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Phone:		**Pages:**	36 including cover
Re:	XM-0022 Appl. No. 09/318,031	**CC:**	

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•Comments:

Dear Krista,

Thank you for you assistance on the telephone today in connection with the above-identified Patent Application.

Please consider this a request for withholding of an abandonment in this matter as we submitted proof that we did file a response to the Second Notice of Non-Compliant Amendment in the form of a facsimile dated February 7, 2002. Also enclosed, per your request, is a copy of the facsimile sent by Kerry Aldridge dated November 17, 2003.

We look forward to your review of the response and further prosecution of this Application.

Sincerely,

Leigh Christian

Activity Report

Date/Time 2-15-02; 5:27PM
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Local Name BENMAN&COLLINS
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** Send **

No.	Doc	Remote Station	Start Time	Duration	Pages	Mode	Comments	Results
1	049	18183435159	2- 6-02; 5:55PM	1'17"	2/ 2	G3		CP 14400
2	052	18174283603	6:02PM	33"	2/ 2	EC		CP 14400
3	062	7037466039	2- 7-02; 11:13AM	0"	-/ 12			056D
* 4	065	17037466039	11:24AM	4'37"	12/ 12	EC		CP 14400
* 5	087	17037466039	11:29AM	46"	2/ 2	EC		CP 14400
6	099	18185050128	2:52PM	50"	1/ 1	G3		CP 9600
7	129	16307929588	9:08PM	2'01"	2/ 2	EC		CP 14400
8	146	16264050144	2- 8-02; 12:59PM	3'48"	4/ 4	G3		CP 14400
9	151	12136803682	2:45PM	1'17"	3/ 3	EC		CP 14400
10	176	18005417622	2-11-02; 1:01PM	60"	2/ 2	EC		CP 9600
11	178	16612548096	1:03PM	1'46"	2/ 2	G3		CP 14400
12	192	16307929588	3:13PM	1'31"	3/ 3	EC		CP 14400
13	198	16192943362	3:44PM	0"	-/ 4			TM
14	200	16192943362	3:45PM	2'18"	6/ 6	EC		CP 12000
15	302	Bill Benman	2-12-02; 10:12AM	58"	2/ 2	EC		CP 14400
16	310	16612548096	1:53PM	3'38"	9/ 9	G3		CP 14400
17	319	19737313035	3:47PM	1'36"	5/ 5	EC		CP 14400
18	334	18314385892	5:02PM	1'19"	4/ 4	EC		CP 14400
19	373	16612548096	2-13-02; 3:55PM	2'15"	6/ 6	G3		CP 14400
20	429	12083963958	6:11PM	1'03"	3/ 3	EC		CP 14400
21	443	16196965393	2-14-02; 12:45PM	44"	2/ 2	EC		CP 14400
22	454	18183435159	2:39PM	0"	-/ 2			056D
23	457	8075699	2:41PM	55"	2/ 2	EC		CP 14400
24	499	16504934549	2-15-02; 3:36PM	0"	-/ 20			0545
25	502	16504934549	3:39PM	6'22"	20/ 20	EC		CP 14400

Total 94

** Receive **

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2	059	3106472616	6:46PM	8'52"	22	EC		CP 14400
3	132	COMPUTRONICS	2- 7-02; 9:16PM	36"	1	EC		CP 14400
4	134	COMPUTRONICS	11:10PM	36"	1	EC		CP 14400
5	154	6612548098	2- 8-02; 2:52PM	7'08"	13	EC		CP 9600
6	165		6:18PM	40"	1	G3		CP 14400
7	167		2-11-02; 10:07AM	42"	1	G3		CP 14400
8	174	213 617 6318	12:34PM	1'32"	6	EC		CP 14400
9	189	EC	1:42PM	31"	1	EC		CP 14400
10	290		2-12-02; 9:23AM	30"	1	EC		CP 14400
11	294	312 269 1571	9:41AM	1'15"	3	EC		CP 14400
12	296	6307929588	9:44AM	57"	2	EC		CP 14400
13	361	0000000000000	2-13-02; 6:29AM	58"	1	G3		CP 14400
14	363	831+4385892	10:51AM	29"	1	EC		CP 14400
15	438	For Removal - 877-39	9:32PM	40"	1	EC		CP 14400
16	438	208 396 3958	2-14-02; 9:37AM	1'17"	4	EC		CP 14400
17	448	208 396 3958	1:34PM	44"	2	EC		CP 14400
18	466	Raytheon	4:12PM	2'14"	6	EC		CP 14400
19	482	6612548098	2-15-02; 9:57AM	1'39"	2	EC		CP 9600
20	484	6612548098	10:01AM	1'39"	2	EC		CP 9600
21	489	SBC - Messaging	11:53AM	1'36"	4	EC		CP 14400
22	491	800 253 1895	11:57AM	1'08"	4	EC		CP 14400
23	493	+1	12:46PM	3'37"	15	EC		CP 14400
24	495		1:12PM	2'14"	5	EC		CP 9600
25	525	310 553 2675	5:26PM	38"	1	EC		RM 14400

Total 102

** Notes **

EC: Error Correct
BC: Broadcast Send
CP: Completed
LS: Local Scan
RE: Resend
MP: Multi-Poll
RM: Receive to Memory
LP: Local Print
PD: Polled by Remote
PG: Polling a Remote
DR: Document Removed
FO: Forced Output
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Transmission Report

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Benman, Brown & Williams

Fax

To: Tamica M. Davis — From: Leigh Christian
Fax: 703 746-6039 — Date: February 7 2002
Phone: — Pages: 13 including Cover
Re: Appl. No. 09/318,031 — CC:

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*Comments:

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Sincerely,

Leigh Christian

Administrative Assistant

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•Comments:

Per your request.

Sincerely,

Leigh Christian

Administrative Assistant

signal. (Those skilled in the art will appreciate that Viterbi decoders and Reed-Solomon decoders are well known in the art.)

Clean Copies of the Claims as amended are provided below:

1. A receiver comprising:

first means for receiving signals in a first band, said first band including multiple carriers;

second means for downconverting said received signals in the first band;

third means for receiving signals in a second band, said second band including multiple carriers;

fourth means for downconverting signals in the second band; and

fifth means for selectively outputting signals from the first band or the second band.

XM - 0022

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	
P. Marko et al.	:	Group Art Unit 2681
Serial No.09/318,031	:	Examiner: T. M. Davis
Filed: May 25, 1999	:	Date: January 28, 2002
For: INTEROPERABLE SATELLITE	:	
DIGITAL AUDIO RADIO SERVICE	:	
(SDARS) RECEIVER ARCHITECTURE	:	

SUPPLEMENTAL AMENDMENT

Commissioner of Patents
and Trademarks
Washington, D. C. 20231

Sir:

In response to the Notice of Non-Compliant Amendment dated January 15, 2002, please amend the above-identified Application as follows and consider the accompanying remarks:

IN THE SPECIFICATION:

Please replace the paragraph beginning at page 6, line 21, with the following rewritten paragraph:

-- Fig. 2 is a diagram which illustrates the system 10 of Fig. 1 in greater detail with a single satellite and a single terrestrial repeater. Fig. 2 shows a broadcast segment 22 and a terrestrial repeater segment 24. In the preferred embodiment, an incoming bit stream is encoded into a time division multiplexed (TDM) signal using a coding scheme such as MPEG by an encoder 26 of conventional design. The TDM bit stream is upconverted to RF by a conventional quadrature phase-shift keyed (QPSK) modulator 28.

The upconverted TDM bit stream is then uplinked to the satellites 12 and 14 by an antenna 30. Those skilled in the art will appreciate that the present invention is not limited to the broadcast segment shown. Other systems may be used to provide signals to the satellites without departing from the scope of the present teachings. --

Please replace the paragraph beginning at page 8, line 20, with the following rewritten paragraph:

-- In order to appreciate the present teachings, reference is made to Fig. 6. Fig. 6 is a detailed view of antenna module 100' and tuner module 200' capable of receiving a single ensemble only. In the preferred embodiment, the system disclosed in Fig. 6 is implemented in accordance with the teachings of U.S. Patent Application No. 09/435,317, entitled **Tuner Architecture for Satellite and Terrestrial Reception of Signals**, filed November 4, 1999 by P. Marko and A. Nguyen (Atty Docket No. XM-0003), the teachings of which are incorporated herein by reference. The signal received by the antenna 110' of the antenna module 100' is amplified by a first low noise amplifier 122' prior to being input to a first image filter 124'. The output of the first image filter 124' is input to a second low noise amplifier 126'. The output of the second low noise amplifier 126' is fed back to the first low noise amplifier 122' via an automatic gain control (AGC) circuit 128' for gain stabilization as will be appreciated by those skilled in the art. The output of the second low noise amplifier 126' constitutes the output of the antenna module 100' and is input to the tuner module 200' via an RF cable 130'. --

Please replace the paragraph beginning at page 9, line 16, with the following rewritten paragraph:

-- In each path 231' or 233', a surface acoustic wave (SAW) filter 212' or 214', respectively, is disposed. The first SAW filter 212' isolates the signals from a selected ensemble received from a terrestrial repeater. The second SAW filter 214' isolates the signals from a selected ensemble received from both satellites. The output of each SAW

filter 212' and 214' is input to a back end integrated circuit (IC) which mixes the filtered signal down from a first intermediate frequency (IF1) to a second intermediate frequency (IF2). For example, for the terrestrial arm 231', IF1 may be 209.760 MHz and IF2 2.99 MHz. --

Please replace the paragraph beginning at page 10, line 3, with the following rewritten paragraph:

-- In addition to the use of a single SAW filter to process the two satellite signals, a novel aspect of the embodiment of Fig. 6 is that since the satellite and terrestrial signals for ensemble A are the mirror image of the satellite and terrestrial signals for ensemble B, both signals can be received by using high side and low side injection into the first mixer 208' using a signal source 221' driven by the switched VCO 219'. See the above-referenced patent application filed by P. Marko and A. Nguyen (Atty Docket No. XM-0003) for a detailed discussion of this feature. --

Please replace the paragraph beginning at page 10, line 24, with the following rewritten paragraph:

-- The mixer 208 will have an approximate 800 MHz output which, in the illustrative embodiment, is filtered by a 12.5 MHz wide SAW filter 212. Note that the use of a single SAW filter in place of the two SAW filters 212' and 214' of Fig. 6 is one advantage of the implementation of Fig. 7. The SAW filter 212 serves to select the entire XM band 40 (see Fig. 3a) including both ensemble A and ensemble B. --

Please replace the paragraph beginning at page 13, line 3, with the following rewritten paragraph:

-- As illustrated in Fig. 5, in the preferred embodiment, at the transport layer 320, the combiner 328 uses a conventional Viterbi decoder (not shown) on soft decision bits from the first and second satellites 12 and 14 as, in the preferred embodiment, these signals are convolutionally encoded. --.

IN THE CLAIMS:

Please amend Claim 1 as follows:

1. (Amended) A receiver comprising:

first means for receiving signals in a first band, said first band including multiple carriers;

second means for downconverting said received signals in the first band;

third means for receiving signals in a second band, said second band including multiple carriers;

fourth means for downconverting signals in the second band; and

fifth means for selectively outputting signals from the first band or the second band.

Please cancel Claims 2, 3 and 25.

Please add the following new Claim:

-- 26. A receiver comprising:

first means for receiving first and second ensembles, each ensemble having multiple carriers on which multiple signals are modulated and

second means for processing said first and said second ensembles to output said signals simultaneously. --

REMARKS

Claims 1 - 25 are presently pending. In the above-identified Office Action, the Examiner objected to the Specification and rejected Claims 1 - 3 and 6 - 10 under 35 U.S.C. § 102(e) as being anticipated by Wang (U. S. Patent No. 5,940,750). Claims 4, 5 and 20 - 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang and well-known prior art. Claim 25 was rejected under 35 U.S.C. § 102(e) as being anticipated by Campanella *et al.* (U. S. Patent No. 6,115,366). Claims 11 - 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang and Anderson *et al.* (U. S. patent No. 5,940,750). Claims 14 - 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang, Anderson, and well-known prior art. Claim 18 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang, Anderson, and Campanella. Claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang and Campanella. Claims 23 and 24 were rejected under 35 U.S.C. § 103(a) as being untenable over Wang, well-known prior art, and Campanella.

By this Amendment, the minor objection to the Specification has been addressed, Claim 1 has been amended, Claims 2, 3 and 25 have been canceled, and new Claim 26 has been presented for consideration. For the reasons set forth more fully below, the present Claims properly define inventions patentable over the prior art. Reconsideration, allowance and passage to issue are therefore respectfully requested.

The subject application teaches a novel receiver design by which first and second bands are received, each band having multiple carriers. The novel receiver is particularly well-suited for satellite radio applications by which multiple carriers are transmitted within first and second ensembles by first and second satellites and a terrestrial repeater. The intention is set forth in Claims of varying scope of which Claim 1 as amended is illustrative. Claim 1 now recites:

1. A receiver comprising:
first means for receiving signals in a first band, said first band including multiple carriers;
second means for downconverting said received signals in the first band;
third means for receiving signals in a second band, said second band including multiple carriers;
fourth means for downconverting signals in the second band; and
fifth means for selectively outputting signals from the first band or the second band. (Emphasis added.)

None of the references, teach, disclose or suggest the invention as presently claimed. That is, none of the references, taken alone or in combination, teach disclose or suggest a receiver adapted to receive signals in first and second bands, each band having multiple carriers, and adapted to selectively output signals from the first band or the second band.

In the above-identified Office Action, the Examiner relied heavily on Wang. Wang purports to teach a low-cost, low noise block downconverter with a self-oscillating mixer for satellite broadcast receivers. In Figs. 6A and 6B Wang appears to teach a receiver architecture adapted to receive signals in multiple bands, the teaching of Wang still falls far short with respect to the invention as presently claimed. That is, Wang fails to teach, show or suggest a receiver architecture adapted to receive signals in first and second bands, **each band having multiple carriers**, and adapted to selectively output signals from the first band or the second band.

The Examiner suggests that in column 7, lines 43 - 46, Wang discloses a receiver capable of receiving first and second bands with multiple carriers. However, this interpretation of the reference is inaccurate. That is, as is clear from column 7, lines 43 - 46 of the reference, the amplifier 172 is adapted to receive a pair of RF signals in first and second frequency bands, respectively. A switch 177 serves to selectively choose the output of a first mixer 176 or a second mixer 178. The downconverted IF signals are then coupled to a power combiner 180. Thus, while it is clear that the receiver is adapted to operate over multiple bands, no teaching is provided with respect to an operation over

multiple bands where **each band has multiple carriers.** Accordingly, the rejections of Claims 1 and 6 - 10 should be withdrawn and these claims should be allowed. Moreover, inasmuch as Anderson and Campanella were cited to provide specific supplemental teachings, all of the claims currently depending from Claim 1, as amended, should be allowable.

Claim 20 defines an interoperable receiver adapted to receive signals in the XM band and the CD band. Inasmuch as the XM band includes multiple carriers, for the reasons set forth above, Claim 20 and the claims dependent thereon should be allowable as well.

Regarding the rejection of Claim 25, the Examiner's position that Campanella discloses a satellite radio receiver architecture is not supported by the teaching of the reference. That is, Campanella fails to teach, disclose, or suggest a satellite radio receiver adapted to receive an audio datastream and a data datastream that is adapted to selectively output said audio and said data datastreams. Accordingly, the rejection of Claim 25 is respectfully submitted as being improper and should be withdrawn.

Inasmuch as new Claim 26 includes limitations directed to the receipt of first and second ensembles, each ensemble having multiple carriers, Claim 26 should be allowable as well.

In short, for the reasons set forth above, all of the Claims presently pending should be allowable. Reconsideration, allowance and passage to issue are respectfully requested.

Respectfully submitted,
P. Marko et al.

By _____
William J. Benman, Jr.
Attorney for Applicant
Registration No. 29,014

Benman, Brown & Williams
2049 Century Park East, Suite 2740
Los Angeles, CA 90067

(310) 553-2400
(310) 553-2675 (fax)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Paragraph beginning at page 6, line 21, has been amended as follows:

Fig. 2 is a diagram which illustrates the system 10 of Fig. 1 in greater detail with a single satellite and a single terrestrial repeater. Fig. 2 shows a broadcast segment 22 and a terrestrial repeater segment 24. In the preferred embodiment, an incoming bit stream is encoded into a time division multiplexed (TDM) signal using a coding scheme such as MPEG by an encoder 26 of conventional design. The TDM bit stream is upconverted to RF by a conventional quadrature phase-shift keyed (QPSK) modulator 28. The upconverted TDM bit stream is then uplinked to the satellites 12 and 14 by an antenna 30. Those skilled in the art will appreciate that the present invention is not limited to the broadcast segment shown. Other systems may be used to provide signals to the satellites without departing from the scope of the present teachings.

Paragraph beginning at page 8, line 20, has been amended as follows:

In order to appreciate the present teachings, reference is made to Fig. 6. Fig. 6 is a detailed view of antenna module 100' and tuner module 200' capable of receiving a single ensemble only. In the preferred embodiment, the system disclosed in Fig. 6 is implemented in accordance with the teachings of U.S. Patent Application No. 09/435,317, entitled **Tuner Architecture for Satellite and Terrestrial Reception of Signals**, filed November 4, 1999 by P. Marko and A. Nguyen (Atty Docket No. XM-0003), the teachings of which are incorporated herein by reference. The signal received by the antenna 110' of the antenna module 100' is amplified by a first low noise amplifier 122' prior to being input to a first image filter 124'. The output of the first image filter 124' is input to a second low noise amplifier 126'. The output of the second low noise amplifier 126' is fed back to the first low noise amplifier 122' via an automatic gain

control (AGC) circuit 128' for gain stabilization as will be appreciated by those skilled in the art. The output of the second low noise amplifier 126' constitutes the output of the antenna module 100' and is input to the tuner module 200' via an RF cable 130'.

Paragraph beginning at page 9, line 16, has been amended as follows:

In each path 231' or 233', a surface acoustic wave (SAW) filter 212' or 214', respectively, is disposed. The first SAW filter 212' isolates the signals from a selected ensemble received from a terrestrial repeater. The second SAW filter 214' isolates the signals from a selected ensemble received from both satellites. The output of each SAW filter 212' and 214' is input to a back end integrated circuit (IC) which mixes the filtered signal down from a first intermediate frequency (IF1) to a second intermediate frequency (IF2). For example, for the terrestrial arm 231', IF1 may be 209.760 MHz and IF2 2.99 MHz.

Paragraph beginning at page 10, line 3, has been amended as follows:

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The mixer 208 will have an approximate 800 MHz output which, in the illustrative embodiment, is filtered by a 12.5 MHz wide SAW filter 212. Note that the use of a single SAW filter in place of the two SAW filters 212' and 214' of Fig. 6 is one advantage of the implementation of Fig. 7. The SAW filter 212 serves to select the entire XM band 40 (see Fig. 3a) including both ensemble A and ensemble B.

Paragraph beginning at page 13, line 3, has been amended as follows:

As illustrated in Fig. 5, in the preferred embodiment, at the transport layer 320, the combiner 328 uses a conventional Viterbi decoder (not shown) on soft decision bits from the first and second satellites 12 and 14 as, in the preferred embodiment, these signals are convolutionally encoded. Next, the Viterbi decoded signals are input to a Reed-Solomon decoder. The Reed-Solomon simply checks the validity or integrity of each codeword and applies corrections to a small percentage of errors. The RS decoded composite satellite signal is then ready for combination with the terrestrial repeater signal. (Those skilled in the art will appreciate that Viterbi decoders and Reed-Solomon decoders are well known in the art.)

IN THE CLAIMS:

Claim 1 has been amended as follows:

1. (Amended) ~~An interoperable~~ receiver comprising:

first means for receiving signals in a first band, said first band including multiple carriers;

second means for downconverting said received signals in the first band;

third means for receiving signals in a second band, said second band including multiple carriers;

fourth means for downconverting signals in the second band; and

fifth means for selectively outputting signals from the first band or the second band.

Claims 2, 3 and 25 have been canceled.

Claim 26 has been added:

26. A receiver comprising:

first means for receiving first and second ensembles, each ensemble having multiple carriers on which multiple signals are modulated and

second means for processing said first and said second ensembles to output said signals simultaneously.

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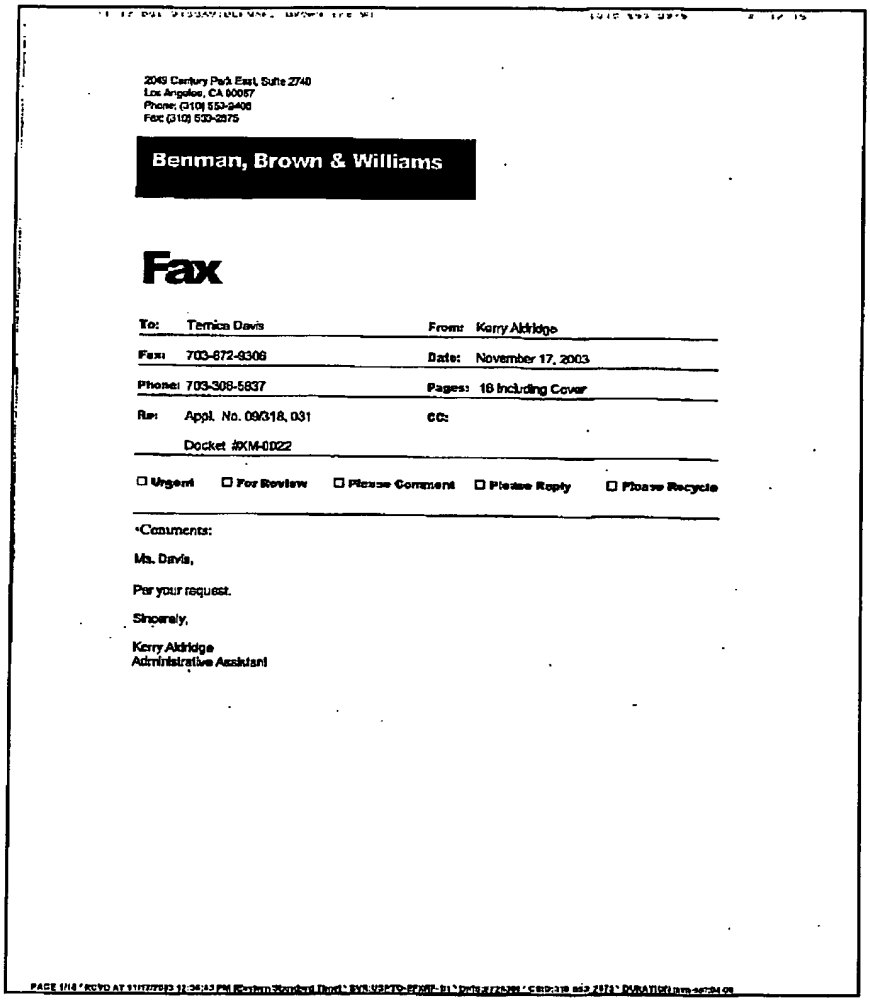

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Sincerely,

Kerry Aldridge
Administrative Assistant

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To: Tamika Davis From: Kerry Aldridge
Fax: 703-872-9306 Date: November 17, 2003
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Docket #99M-0022

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signal. (Those skilled in the art will appreciate that Viterbi decoders and Reed-Solomon decoders are well known in the art.)

Clean Copies of the Claims as amended are provided below:

1. A receiver comprising:

first means for receiving signals in a first band, said first band including multiple carriers;

second means for downconverting said received signals in the first band;

third means for receiving signals in a second band, said second band including multiple carriers;

fourth means for downconverting signals in the second band; and

fifth means for selectively outputting signals from the first band or the second band.

without underlines on commas

Receipt is hereby acknowledged for the following in the U.S. Patent and Trademark Office

In re Application of	:	
P. Marko et al.	:	Group Art Unit 2681
Serial No.09/318,031	:	Examiner: T. M. Davis
Filed: May 25, 1999	:	Date: August 14, 2001
For: INTEROPERABLE SATELLITE	:	
DIGITAL AUDIO RADIO SERVICE	:	
(SDARS) RECEIVER ARCHITECTURE	:	

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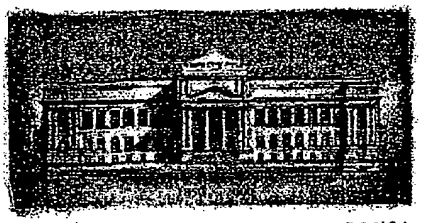

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TRANSMITTAL FORM

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Total Number of Pages in This Submission: 11

Application Number	09/318,031
Filing Date	May 25, 1999
First Named Inventor	P. Marko et al.
Group Art Unit	2681
Examiner Name	T. Davis
Attorney Docket Number	XM-0022

ENCLOSURES *(check all that apply)*

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Date	August 14, 2001

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	
P. Marko et al.	:	Group Art Unit 2681
Serial No.09/318,031	:	Examiner: T. M. Davis
Filed: May 25, 1999	:	Date: August 9, 2001
For: INTEROPERABLE SATELLITE	:	
DIGITAL AUDIO RADIO SERVICE	:	
(SDARS) RECEIVER ARCHITECTURE	:	

SUPPLEMENTAL AMENDMENT

Commissioner of Patents
and Trademarks
Washington, D. C. 20231

Sir:

In response to the Notice of Non-Compliant Amendment dated July 19, 2001, please amend the above-identified Application as follows and consider the accompanying remarks:

IN THE SPECIFICATION:

Page 6, line 22, after "repeater", please insert a period -- . --.

Page 8, line 24, please replace the blank "_____" with -- 09/435,317 --.

Page 8, line 25, please replace the blank "_____" with -- November 4, 1999 --.

Page 9, line 16, please change "In each path 212' or 214', a surface acoustic wave (SAW) filter is disposed." to -- In each path 231' or 233', a surface acoustic wave (SAW) filter 212' or 214', respectively, is disposed. --

Page 9, line 19, please change "first" to -- each --.

Page 10, line 7, after "using", please insert -- a signal source -- and on line 24, after "mixer", please insert -- 208 --.

Page 13, line 3, please change:

> "As illustrated in at the transport layer 320 in Fig. 5, in the preferred embodiment, the combiner uses a conventional Viterbi decoder (not shown) on soft decision bits from the first and second satellites 12 and 14 as, in the preferred embodiment, these signals are convolutionally encoded."

to:

> -- As illustrated in Fig. 5, in the preferred embodiment, at the transport layer 320, the combiner 328 uses a conventional Viterbi decoder (not shown) on soft decision bits from the first and second satellites 12 and 14 as, in the preferred embodiment, these signals are convolutionally encoded. --.

IN THE CLAIMS:

Please amend the Claims as follows:

1. (Amended) A[n interoperable] receiver comprising:

first means for receiving signals in a first band, said first band including multiple carriers;

second means for downconverting said received signals in the first band;

third means for receiving signals in a second band, said second band including multiple carriers;

fourth means for downconverting signals in the second band; and

fifth means for selectively outputting signals from the first band or the second band.

Please cancel Claims 2, 3 and 25.

Please add the following new Claim:

-- 26. A receiver comprising:

first means for receiving first and second ensembles, each ensemble having multiple carriers on which multiple signals are modulated and

second means for processing said first and said second ensembles to output said signals simultaneously. --

Clean copies of the replacement paragraph as amended are provided below:

Fig. 2 is a diagram which illustrates the system 10 of Fig. 1 in greater detail with a single satellite and a single terrestrial repeater. Fig. 2 shows a broadcast segment 22 and a terrestrial repeater segment 24. In the preferred embodiment, an incoming bit stream is encoded into a time division multiplexed (TDM) signal using a coding scheme such as MPEG by an encoder 26 of conventional design. The TDM bit stream is upconverted to RF by a conventional quadrature phase-shift keyed (QPSK) modulator 28. The upconverted TDM bit stream is then uplinked to the satellites 12 and 14 by an antenna 30. Those skilled in the art will appreciate that the present invention is not limited to the broadcast segment shown. Other systems may be used to provide signals to the satellites without departing from the scope of the present teachings.

In order to appreciate the present teachings, reference is made to Fig. 6. Fig. 6 is a detailed view of antenna module 100' and tuner module 200' capable of receiving a single ensemble only. In the preferred embodiment, the system disclosed in Fig. 6 is implemented in accordance with the teachings of U.S. Patent Application No. 09/435,317, entitled **Tuner Architecture for Satellite and Terrestrial Reception of Signals**, filed November 4, 1999 by P. Marko and A. Nguyen (Atty Docket No. XM-0003), the teachings of which are incorporated herein by reference. The signal received by the antenna 110' of the antenna module 100' is amplified by a first low noise amplifier 122' prior to being input to a first image filter 124'. The output of the first image filter 124' is input to a second low noise amplifier 126'. The output of the second low noise amplifier 126' is fed back to the first low noise amplifier 122' via an automatic gain control (AGC) circuit 128' for gain stabilization as will be appreciated by those skilled in the art. The output of the second low noise amplifier 126' constitutes the output of the antenna module 100' and is input to the tuner module 200' via an RF cable 130'.

In each path 231' or 233', a surface acoustic wave (SAW) filter 212' or 214', respectively, is disposed. The first SAW filter 212' isolates the signals from a selected ensemble received from a terrestrial repeater. The second SAW filter 214' isolates the signals from a selected ensemble received from both satellites. The output of each SAW filter 212' and 214' is input to a back end integrated circuit (IC) which mixes the filtered signal down from a first intermediate frequency (IF1) to a second intermediate frequency (IF2). For example, for the terrestrial arm 231', IF1 may be 209.760 MHz and IF2 2.99 MHz.

In addition to the use of a single SAW filter to process the two satellite signals, a novel aspect of the embodiment of Fig. 6 is that since the satellite and terrestrial signals for ensemble A are the mirror image of the satellite and terrestrial signals for ensemble B, both signals can be received by using high side and low side injection into the first mixer 208' using a signal source 221' driven by the switched VCO 219'. See the above-referenced patent application filed by P. Marko and A. Nguyen (Atty Docket No. XM-0003) for a detailed discussion of this feature.

The mixer 208 will have an approximate 800 MHz output which, in the illustrative embodiment, is filtered by a 12.5 MHz wide SAW filter 212. Note that the use of a single SAW filter in place of the two SAW filters 212' and 214' of Fig. 6 is one advantage of the implementation of Fig. 7. The SAW filter 212 serves to select the entire XM band 40 (see Fig. 3a) including both ensemble A and ensemble B.

As illustrated in Fig. 5, in the preferred embodiment, at the transport layer 320, the combiner 328 uses a conventional Viterbi decoder (not shown) on soft decision bits from the first and second satellites 12 and 14 as, in the preferred embodiment, these signals are convolutionally encoded. Next, the Viterbi decoded signals are input to a Reed-Solomon decoder. The Reed-Solomon simply checks the validity or integrity of each codeword and applies corrections to a small percentage of errors. The RS decoded composite satellite signal is then ready for combination with the terrestrial repeater

signal. (Those skilled in the art will appreciate that Viterbi decoders and Reed-Solomon decoders are well known in the art.)

Clean Copies of the Claims as amended are provided below:

1. A receiver comprising:

first means for receiving signals in a first band, said first band including multiple carriers;

second means for downconverting said received signals in the first band;

third means for receiving signals in a second band, said second band including multiple carriers;

fourth means for downconverting signals in the second band; and

fifth means for selectively outputting signals from the first band or the second band.

REMARKS

Claims 1 - 25 are presently pending. In the above-identified Office Action, the Examiner objected to the Specification and rejected Claims 1 - 3 and 6 - 10 under 35 U.S.C. § 102(e) as being anticipated by Wang (U. S. Patent No. 5,940,750). Claims 4, 5 and 20 - 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang and well-known prior art. Claim 25 was rejected under 35 U.S.C. § 102(e) as being anticipated by Campanella *et al.* (U. S. Patent No. 6,115,366). Claims 11 - 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang and Anderson *et al.* (U. S. patent No. 5,940,750). Claims 14 - 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang, Anderson, and well-known prior art. Claim 18 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang, Anderson, and Campanella. Claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang and Campanella. Claims 23 and 24 were rejected under 35 U.S.C. § 103(a) as being untenable over Wang, well-known prior art, and Campanella.

By this Amendment, the minor objection to the Specification has been addressed, Claim 1 has been amended, Claims 2, 3 and 25 have been canceled, and new Claim 26 has been presented for consideration. For the reasons set forth more fully below, the present Claims properly define inventions patentable over the prior art. Reconsideration, allowance and passage to issue are therefore respectfully requested.

The subject application teaches a novel receiver design by which first and second bands are received, each band having multiple carriers. The novel receiver is particularly well-suited for satellite radio applications by which multiple carriers are transmitted within first and second ensembles by first and second satellites and a terrestrial repeater. The intention is set forth in Claims of varying scope of which Claim 1 as amended is illustrative. Claim 1 now recites:

1. A receiver comprising:
first means for receiving signals in a first band, said first band including multiple carriers;
second means for downconverting said received signals in the first band;
third means for receiving signals in a second band, said second band including multiple carriers;
fourth means for downconverting signals in the second band; and
fifth means for selectively outputting signals from the first band or the second band. (Emphasis added.)

None of the references, teach, disclose or suggest the invention as presently claimed. That is, none of the references, taken alone or in combination, teach disclose or suggest a receiver adapted to receive signals in first and second bands, each band having multiple carriers, and adapted to selectively output signals from the first band or the second band.

In the above-identified Office Action, the Examiner relied heavily on Wang. Wang purports to teach a low-cost, low noise block downconverter with a self-oscillating mixer for satellite broadcast receivers. In Figs. 6A and 6B Wang appears to teach a receiver architecture adapted to receive signals in multiple bands, the teaching of Wang still falls far short with respect to the invention as presently claimed. That is, Wang fails to teach, show or suggest a receiver architecture adapted to receive signals in first and second bands, **each band having multiple carriers**, and adapted to selectively output signals from the first band or the second band.

The Examiner suggests that in column 7, lines 43 - 46, Wang discloses a receiver capable of receiving first and second bands with multiple carriers. However, this interpretation of the reference is inaccurate. That is, as is clear from column 7, lines 43 - 46 of the reference, the amplifier 172 is adapted to receive a pair of RF signals in first and second frequency bands, respectively. A switch 177 serves to selectively choose the output of a first mixer 176 or a second mixer 178. The downconverted IF signals are then coupled to a power combiner 180. Thus, while it is clear that the receiver is adapted to operate over multiple bands, no teaching is provided with respect to an operation over multiple bands where **each band has multiple carriers**. Accordingly, the rejections of

Claims 1 and 6 - 10 should be withdrawn and these claims should be allowed. Moreover, inasmuch as Anderson and Campanella were cited to provide specific supplemental teachings, all of the claims currently depending from Claim 1, as amended, should be allowable.

Claim 20 defines an interoperable receiver adapted to receive signals in the XM band and the CD band. Inasmuch as the XM band includes multiple carriers, for the reasons set forth above, Claim 20 and the claims dependent thereon should be allowable as well.

Regarding the rejection of Claim 25, the Examiner's position that Campanella discloses a satellite radio receiver architecture is not supported by the teaching of the reference. That is, Campanella fails to teach, disclose, or suggest a satellite radio receiver adapted to receive an audio datastream and a data datastream that is adapted to selectively output said audio and said data datastreams. Accordingly, the rejection of Claim 25 is respectfully submitted as being improper and should be withdrawn.

Inasmuch as new Claim 26 includes limitations directed to the receipt of first and second ensembles, each ensemble having multiple carriers, Claim 26 should be allowable as well.

In short, for the reasons set forth above, all of the Claims presently pending should be allowable. Reconsideration, allowance and passage to issue are respectfully requested.

Respectfully submitted,
P. Marko et al.

By _____
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Attorney for Applicant
Registration No. 29,014

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